Technical Data

Danfoss DHP-C

- Provides heating, cooling and hot water
- TWS technology provides hot water quickly with low operating costs
- A built in 180 litre water tank

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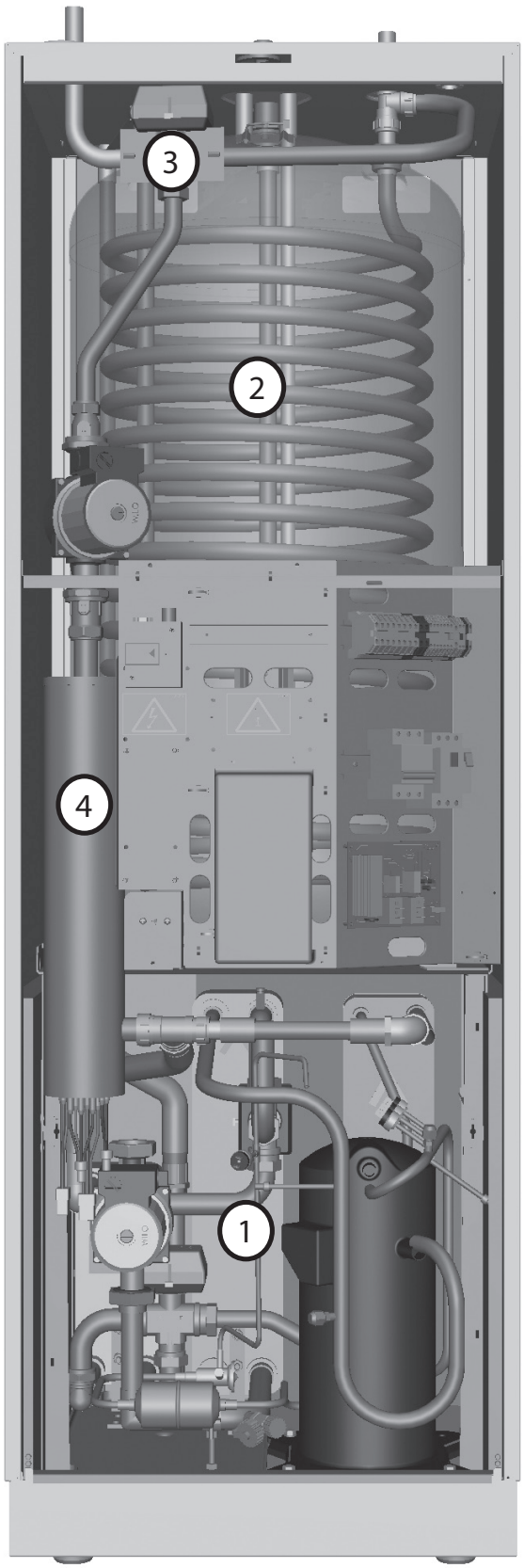
Main parts



1 Heat pump unit
- Scroll compressor
- Stainless steel heat exchanger
- Circulation pumps for brine and heating systems
- Valves and safety equipment for cooling systems and corresponding electrical components.

2 Water heater
- 180 litres
- Internal anti-corrosion protection with copper or stainless steel
- It has an anode that does not require replacing, which means that it is maintenance-free

3 Exchange valve
- The heated water either passes through to the heating system or to the water heater depending on whether heating or hot water is to be produced

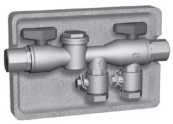
4 Auxiliary heat
- 9 kW electric heating element (4.5 kW at 230 V heat pump installation)
- Electric heating element control in maximum of three steps
- Installed on the heating system's supply pipe
- Covers the demand of extra energy if the heat pump's capacity is exceeded
- Automatically connected in the heat pump unit if operating mode AUTO is selected.

5 Control equipment
- Control computer with graphic display
- Temperature sensors (outdoor, supply pipe, return pipe, brine and hot water)
- Room sensor (option)

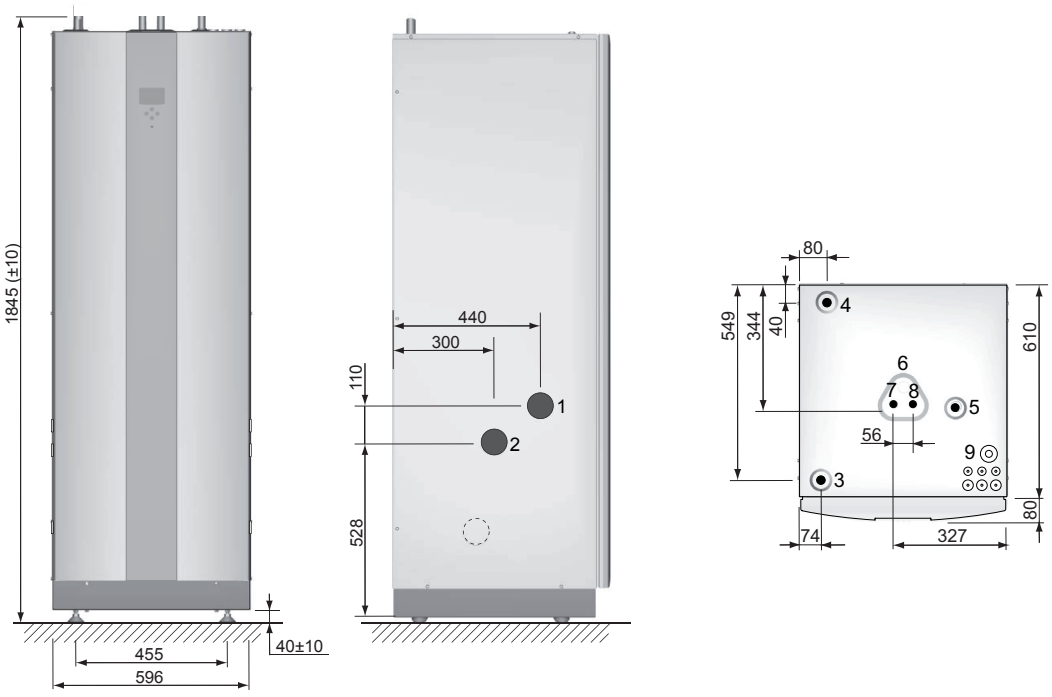
The control equipment controls the heat pup unit's included components (compressor, circulation pumps, auxiliary heaters and exchange valve) and determines when to start and stop the pump as well as producing heat for the house or hot water.

Bipack contents

Sizes 4kW - 10kW:

Part no.	Quantity	Name
086U2369	1	Safety valve 9 bar 1/2"
086U2701	1	Outdoor sensor Kimsafe 200 035
086U0896	1	Safety valve 1.5 bar 1/2"
086U2824	1	Expansion and bleed tank without valve
086U0026	5	Rubber collar hole 22-32mm
086U6033	2	Flex. hose DN20 L=550
086U6006 	1	Filling device brine DN25
086U6005	1	Dirt filter with shut-off DN25

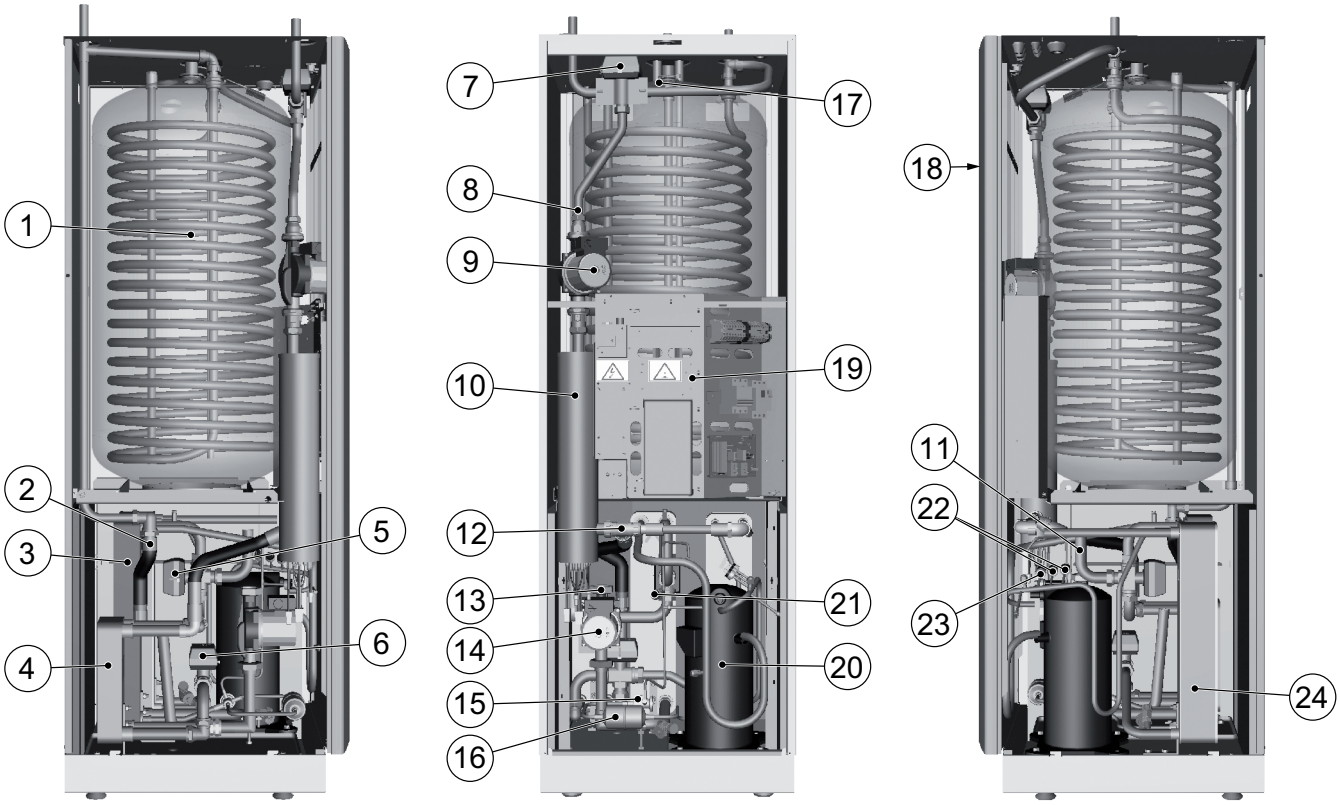
Dimensions and connections



The brine pipes can be connected on either the left or right-hand sides of the heat pump.

Position	Name
1	Brine in, 28 Cu
2	Brine out, 28 Cu
3	Supply line heating system, 22 Cu
4	Return line heating system, 22 Cu
5	Expansion line, 22 Cu
6	Lifting point
7	Hot water line, 22 Cu or stainless steel
8	Cold water line, 22 Cu or stainless steel
9	Lead-in for supply, sensor and communication cables

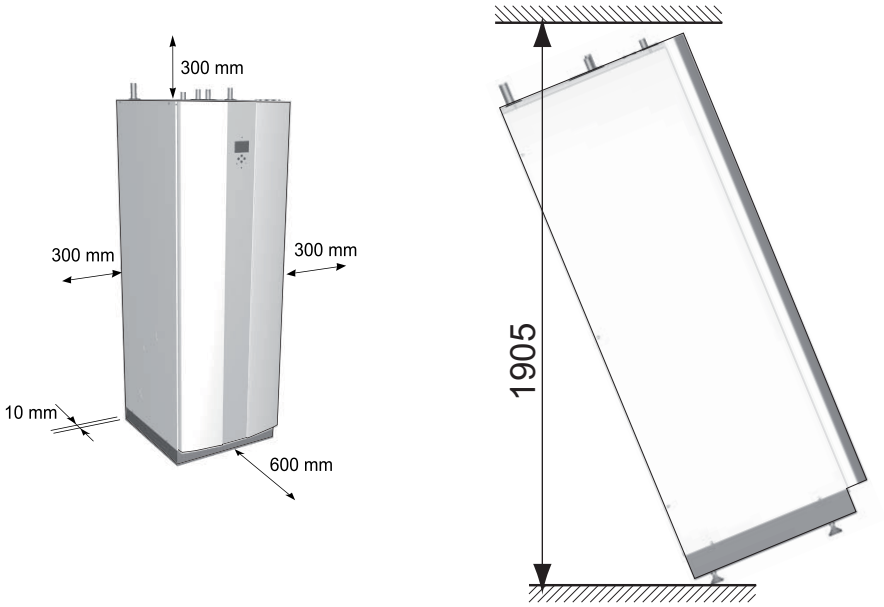
Components



Left view Front view Right view

Position	Name
1	Water heater, 180 litres
2	Return line sensor, heating system
3	Evaporator, insulated
4	Heat exchanger for cooling operation
5	Exchange valve cooling
6	Shunt cooling
7	Exchange valve, heating/hot water
8	Supply line sensor
9	Heating system circulation pump
10	Auxiliary heating, immersion heater
11	Brine in
12	Heating system supply line
13	Brine out
14	Brine pump brine system
15	Expansion valve
16	Drying filter
17	Hot water temperature sensor (displays maximum temperature)
18	Control panel for control equipment
19	Electrical panel
20	Compressor
21	Low pressure pressostat
22	Operating pressostats
23	High pressure pressostat
24	Condenser with primary side drain

Space requirement



Necessary service space and minimum headroom for heat pump installation.

Sensors

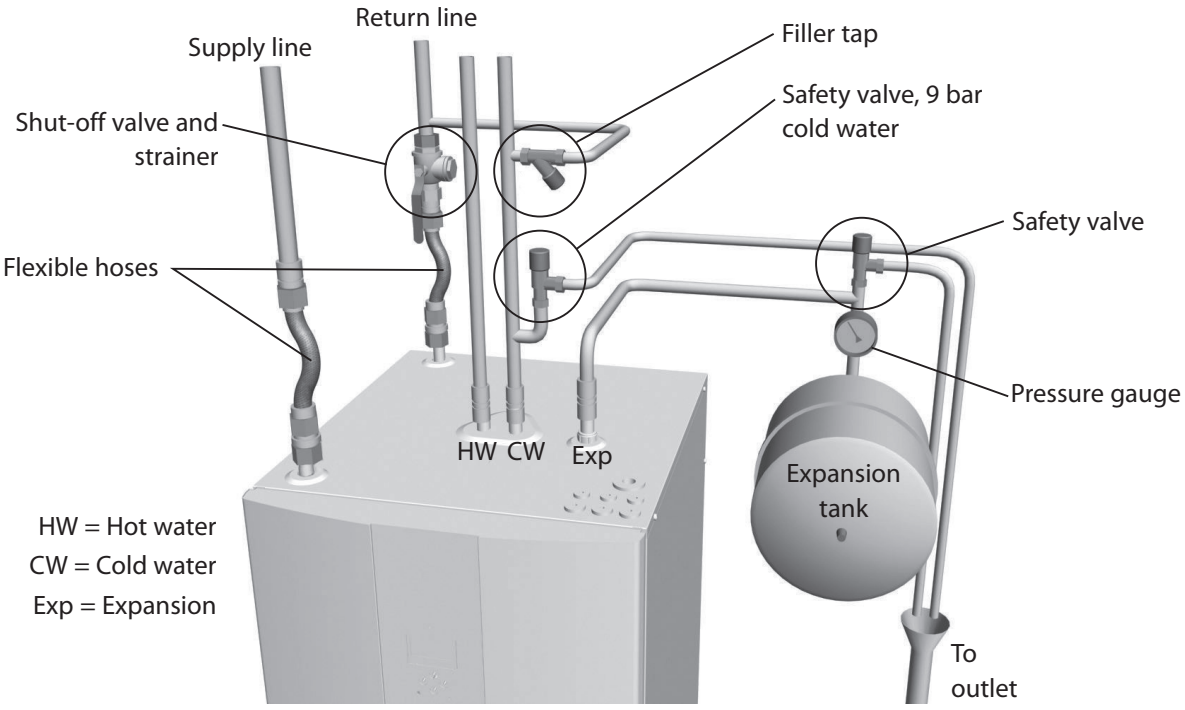
Outdoor sensor	
°C	Ohm
-30	1884
-25	1443
-20	1115
-15	868
-10	681
-5	538
0	428
5	343
10	276
15	224
20	183
25	150
30	124
35	103
40	86

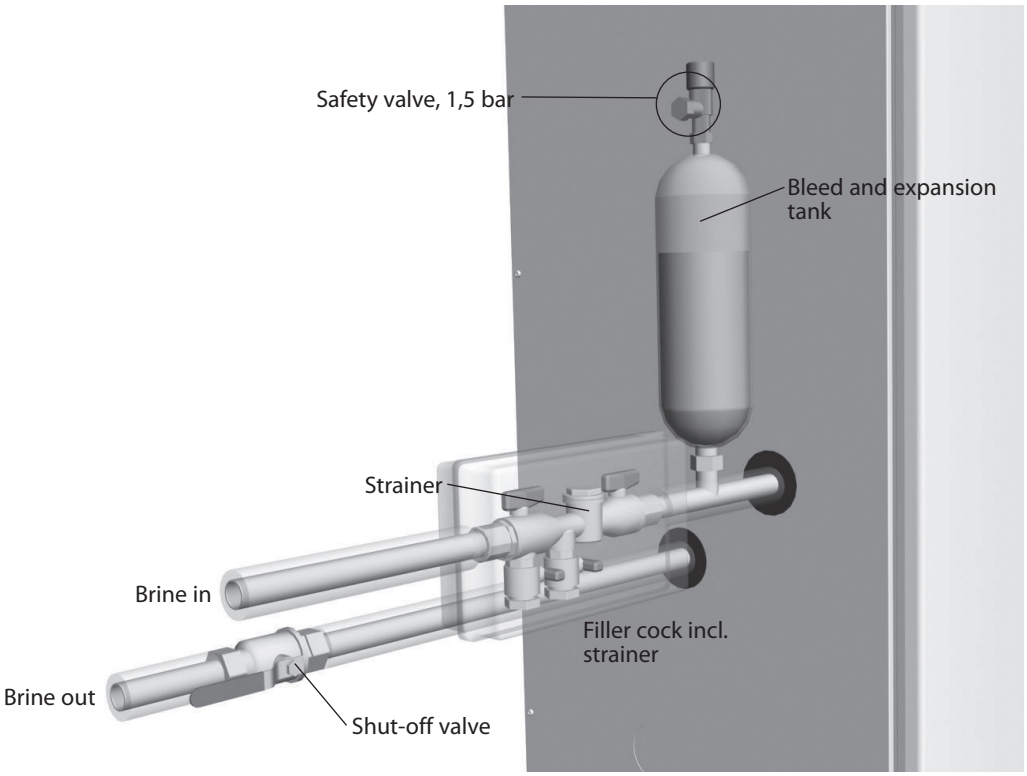
Other sensors	
°C	kilo-Ohm
0	66,3
5	52,4
10	41,8
15	33,5
20	27,1
25	22,0
30	18,0
35	14,8
40	12,2
45	10,1
50	8,5
55	7,1
60	6,0
65	5,0
70	4,2
75	3,7
80	3,1
85	2,7
90	2,3
95	2,0

Conversion table for sensors

NOTE! When reading the resistance of the sensors, the sensor leads must first be disconnected from the control equipment.

Installation principle





Auxiliary heating and energy consumption calculation

The auxiliary heater is made up of an electric heating element on the supply pipe that has two outputs, ADD.HEAT 1 and ADD.HEAT 2, and can be controlled in three steps:

For three phase, 400V, installations:

- Step 1 = ADD.HEAT 1 = 3 kW
- Step 2 = ADD.HEAT 2 = 6 kW
- Step 3 = ADD.HEAT 1 + ADD.HEAT 2 = 9 kW

For single phase, 230V, installations:

- Step 1 = ADD.HEAT 1 = 1.5 kW
- Step 2 = ADD.HEAT 2 = 3 kW
- Step 3 = ADD.HEAT 1 + ADD.HEAT 2 = 4.5 kW

In the event of an alarm, the auxiliary heater engages automatically.

The energy consumption calculation is difficult to specify exactly, but the average output for a normal house with normal hot water consumption in the following tables gives a relatively accurate result for each heat pump and heating system. Remember that the operating time for the heat pump installation must exceed one year before the specified values in the table are valid.

The energy consumption for legion operation is included in the hours for ADD.HEAT 1.

The indicated outputs include circulation pumps.

DHP-C	*-4H*	*-5H*	*-6*	*-7H*	*-8*	*-10*
Under floor heating	1.15 kW	1.40 kW	1.59 kW	1.70 kW	2.00 kW	2.55 kW
Radiators	1.30 kW	1.55 kW	1.88 kW	1.95 kW	2.36 kW	3.03 kW

To calculate the energy consumption:

1 Press either the right or left button once to open the INFORMATION main menu. The cursor is in the OPERATION menu option.
2 Press the down button to move the cursor to the OPERAT.TIME menu option.
3 Open the menu by pressing the right button once.
4 Note how many hours the following values have: HEATPUMP, ADD.HEAT 1, and ADD.HEAT 2.
5 In the tables above find the value for the average output that corresponds to your heat pump and heating system, and multiply it by the number of HEAT PUMP hours. Note the result.
6 Multiply the number of ADD.HEAT 1 hours by 3. Note the result.
7 Multiply the number of ADD.HEAT 2 hours by 6. Note the result.
8 Add up the multiplied values to obtain the total energy consumption.

Technical data

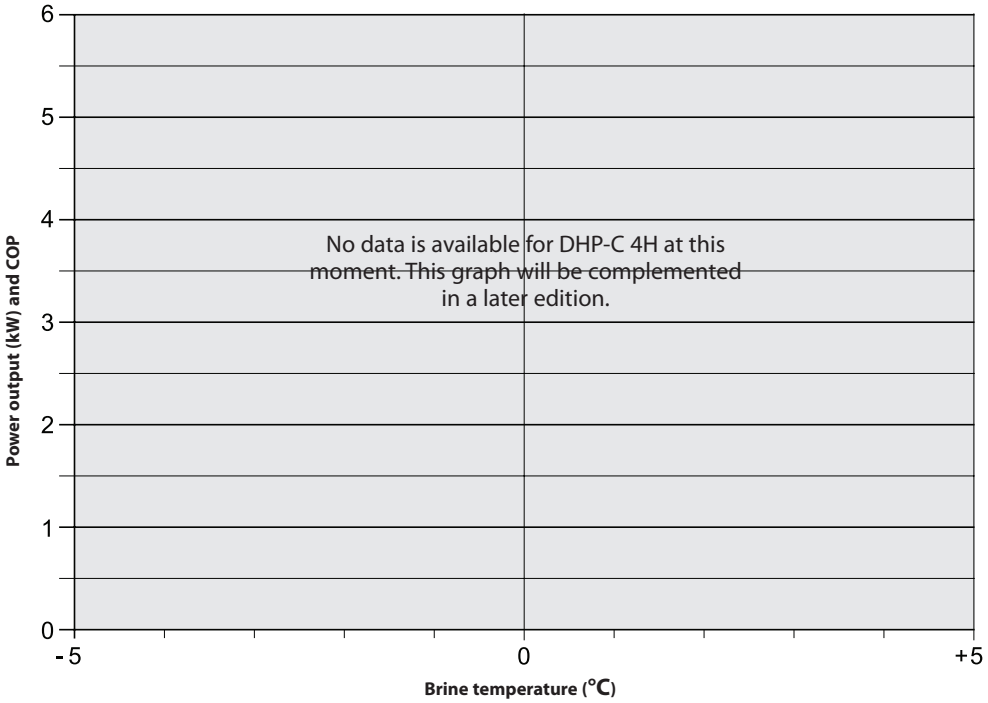
Heat pump DHP-C			***4H***	***5H***	***7H***	***6***	***8***	***10***
Refrigerant	Type		R134a	R134a	R134a	R407C	R407C	R407C
	Amount	kg	0.90	1.00	1.10	1.20	1.30	1.45
	Test pressure	MPa	3.2	3.2	3.2	3.2	3.2	3.2
	Design pressure	MPa	2.45	2.45	2.45	3.1	3.1	3.1
Compressor	Type		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
	Oil		POE	POE	POE	POE	POE	POE
Electrical data 3-N	Main supply	Volt	400V 3-N	400V 3-N	400V 3-N	400V 3-N	400V 3-N	400V 3-N
	Rated power, compressor	kW	2.7	2.0	2.3	2.0	2.3	3.6
	Auxiliary heater, max 3 steps	kW	3/6/9	3/6/9	3/6/9	3/6/9	3/6/9	3/6/9
	Start current	A	36	14	29	14	25	29
	Circuit breaker	A	$10^2/10^3/16^4$	$10^2/16^3/20^4$	$10^2/16^3/20^4$	$10^2/16^3/20^4$	$16^2/16^3/20^4$	$16^2/16^3/20^4$
Performance [1]	Output capacity	kW	3.2	4.5	5.5	4.9	7.2	8.9
	Heat factor	COP	2.7	2.9	2.9	2.8	3.1	3.2
Nominal flow [6]	Cooling circuit	l/s	0.20	0.28	0.37	0.3	0.5	0.6
	Heating circuit	l/s	0.08	0.12	0.14	0.1	0.2	0.2
External available pressure [5]	Cooling circuit	kPa	34	48	54	31	33	32
	Heating circuit	kPa	61	60	58	44	42	39
Max/min temperature	Cooling circuit	°C	20/-10	20/-10	20/-10	20/-10	20/-10	20/-10
	Heating circuit	°C	65/20	65/20	65/20	55/20	55/20	55/20
Pressure switches	Low pressure	MPa	0.03	0.03	0.03	0.08	0.08	0.08
	Operating	MPa	1.80	1.80	1.80	2.65/2.85	2.65/2.85	2.65/2.85
	High pressure	MPa	2.45	2.45	2.45	3.10	3.10	3.10
Anti freeze media			Ethylene glycol/ Ethanol	Ethylene glycol/ Ethanol	Ethylene glycol/ Ethanol	Ethylene glycol/ Ethanol	Ethylene glycol/ Ethanol	Ethylene glycol/ Ethanol
Water heater volume		l	180	180	180	180	180	180
Weight		kg	210	215	225	210	215	225

[1] At B0W45 according to EN 14511 (including circulation pumps).
[2] Heat pump with 3 kW auxiliary heater.
[3] Heat pump with 6 kW auxiliary heater.
[4] Heat pump with 9 kW auxiliary heater.
[5] Pressure drop that must not be exceeded outside the heat pump without the nominal flow being reduced. For the cooling circuit these values require a pipe of Ø 40x2.4.
[6] Nominal flow: heating circuit Δ10K, cooling circuit Δ3K.

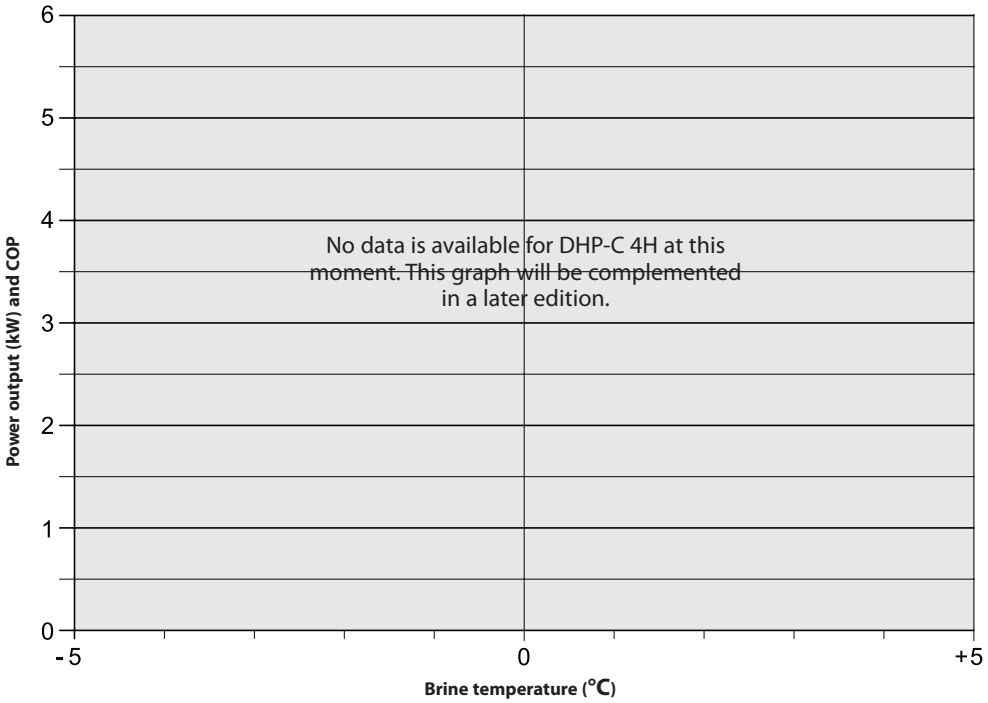
Power output and COP* graphs

The data shown in the graphs is according to EN14511 including circulation pumps.

DHP-C 4H, supply line 35°C



DHP-C 4H, supply line 45°C

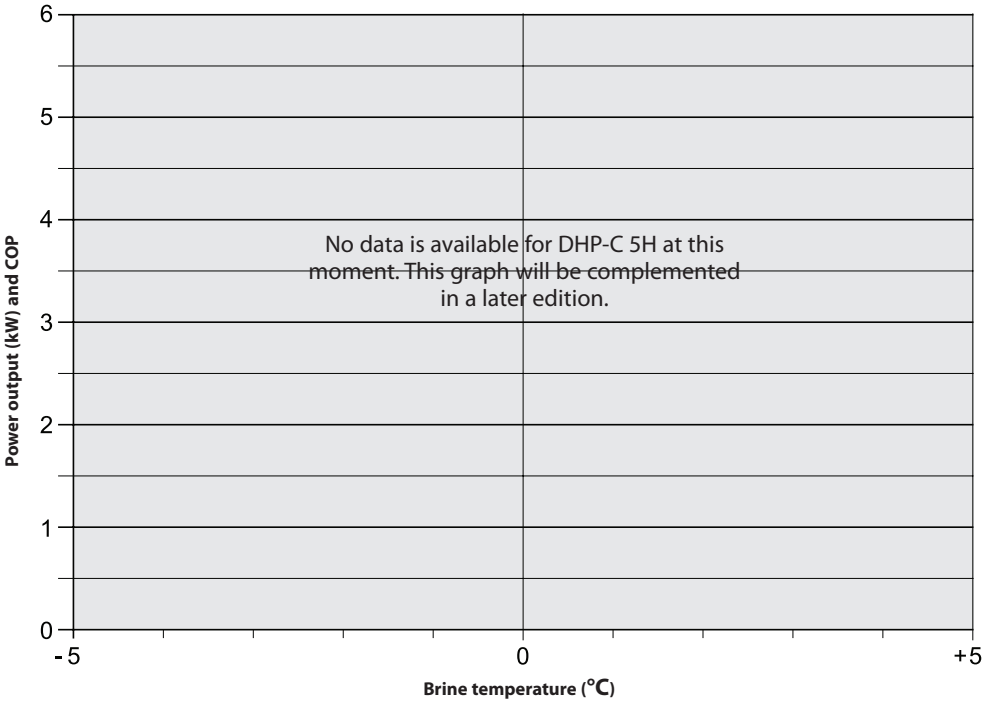


*) COP = Coefficient of Performance

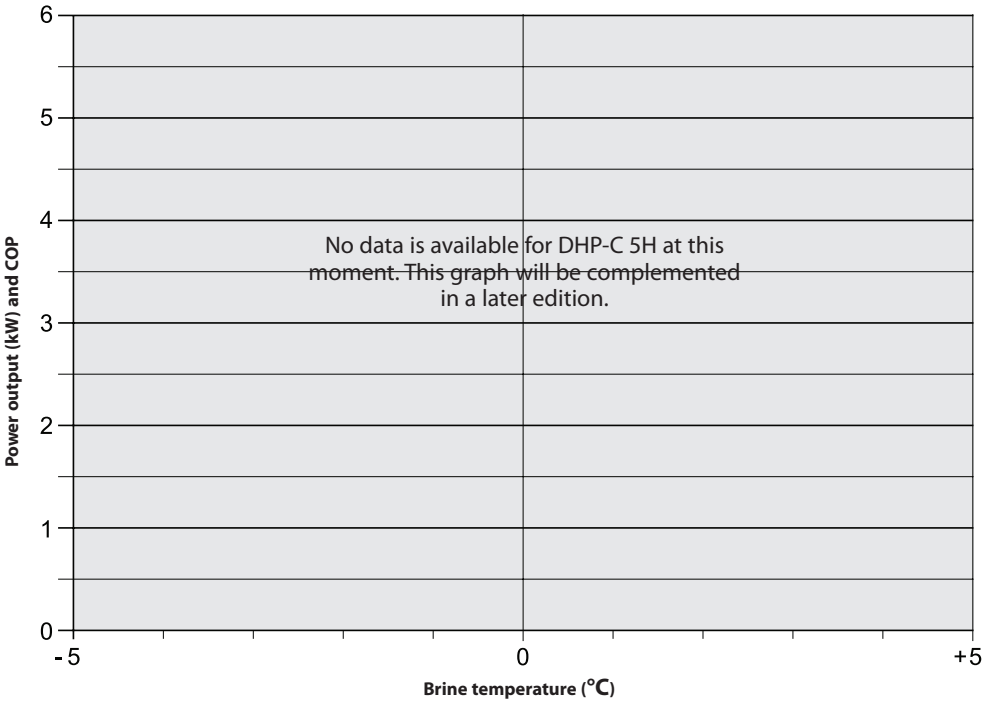
Power output and COP graphs

The data shown in the graphs is according to EN14511 including circulation pumps.

DHP-C 5H, supply line 35°C



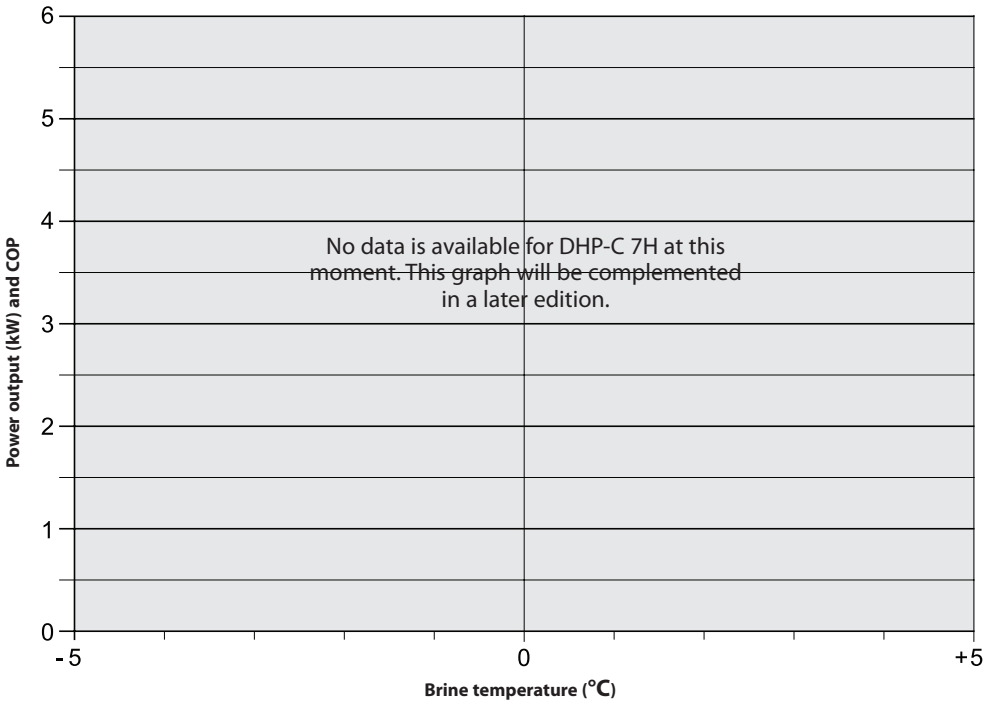
DHP-C 5H, supply line 45°C



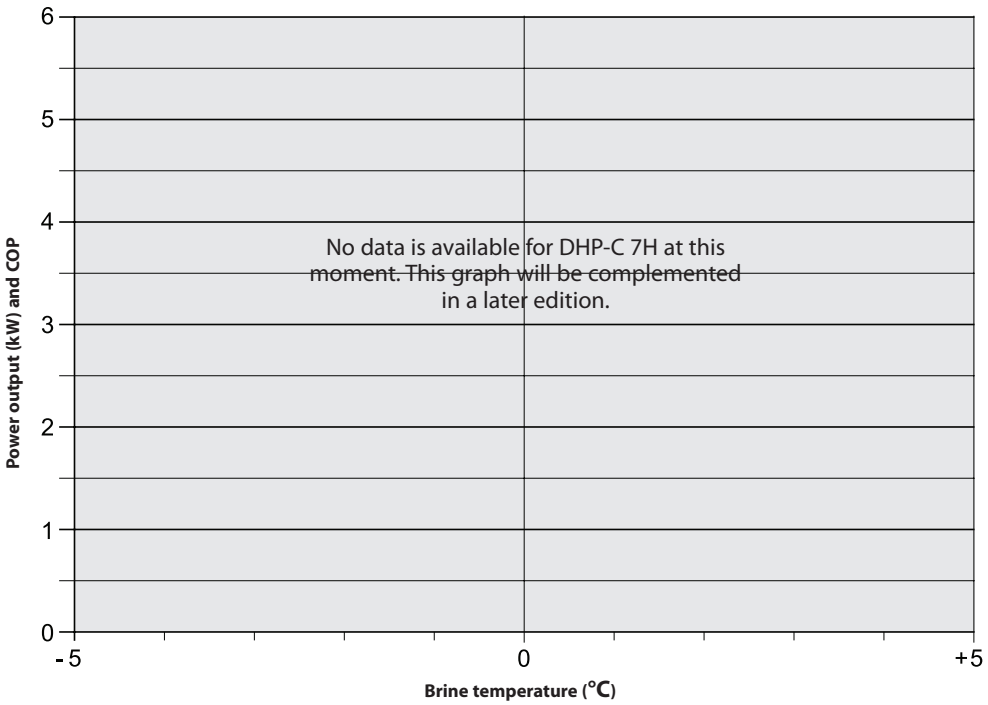
Power output and COP graphs

The data shown in the graphs is according to EN14511 including circulation pumps.

DHP-C 7H, supply line 35°C



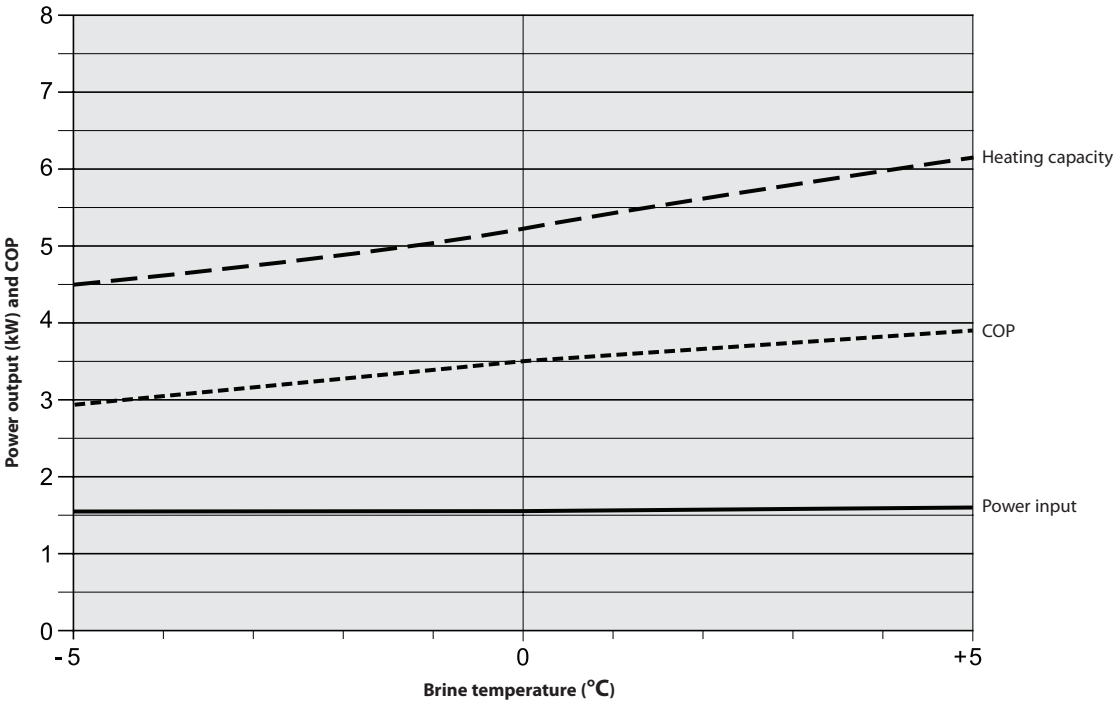
DHP-C 7H, supply line 45°C



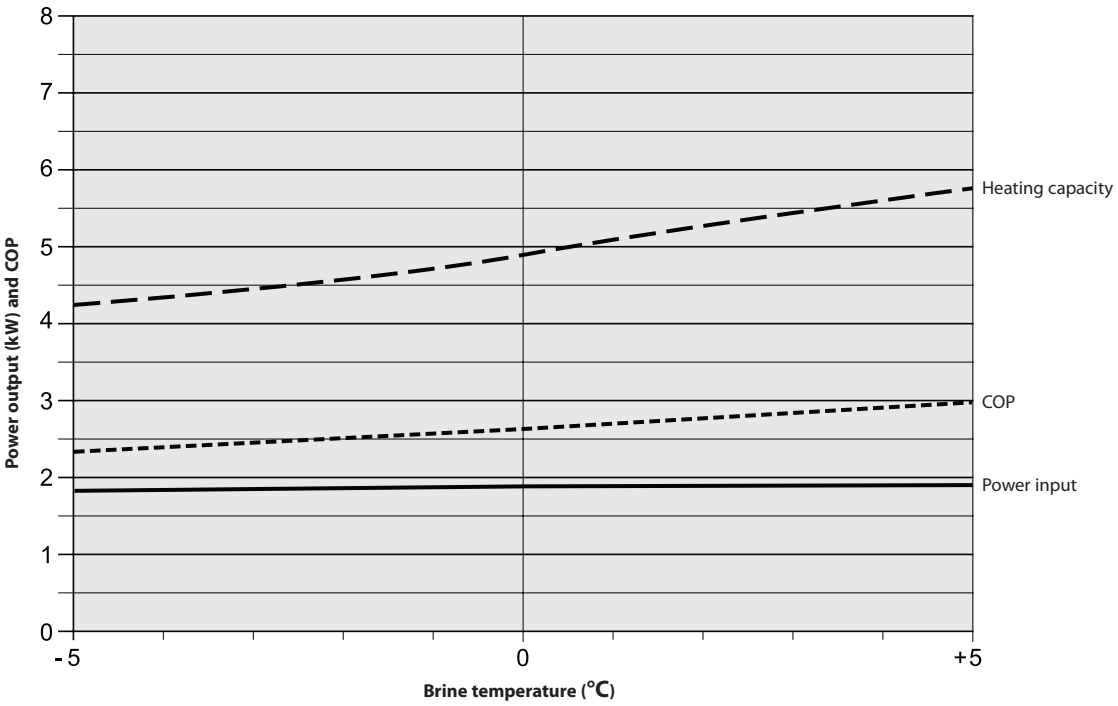
Power output and COP graphs

The data shown in the graphs is according to EN14511 including circulation pumps.

DHP-C 6, supply line 35°C



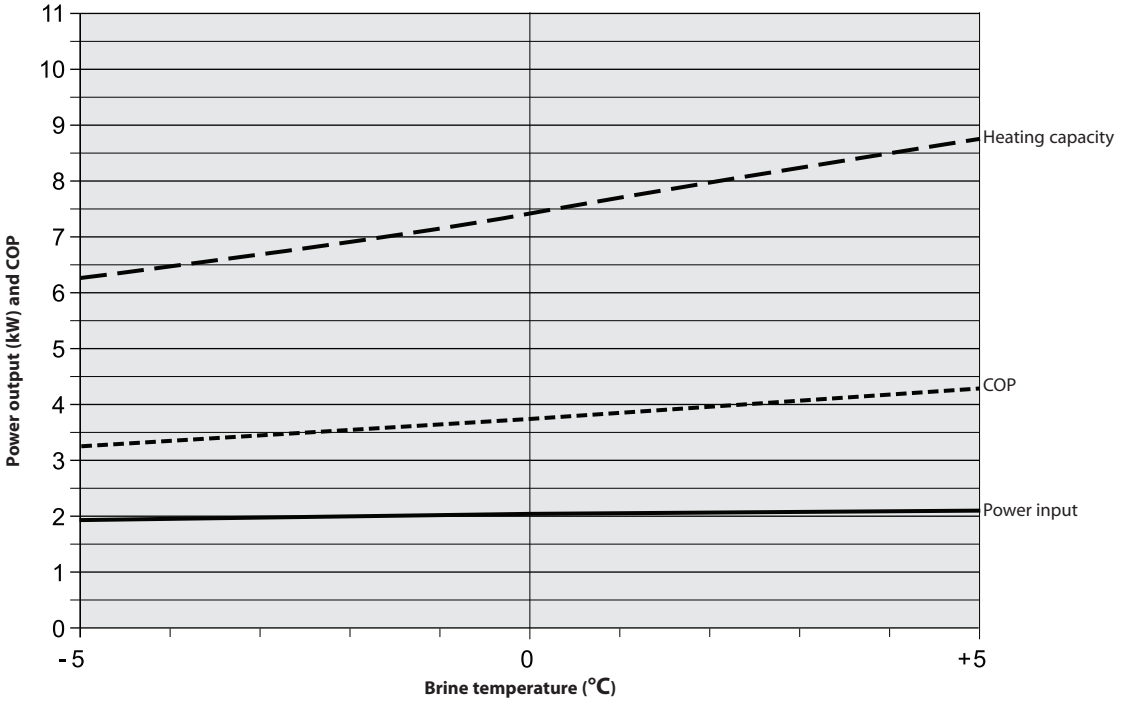
DHP-C 6, supply line 45°C



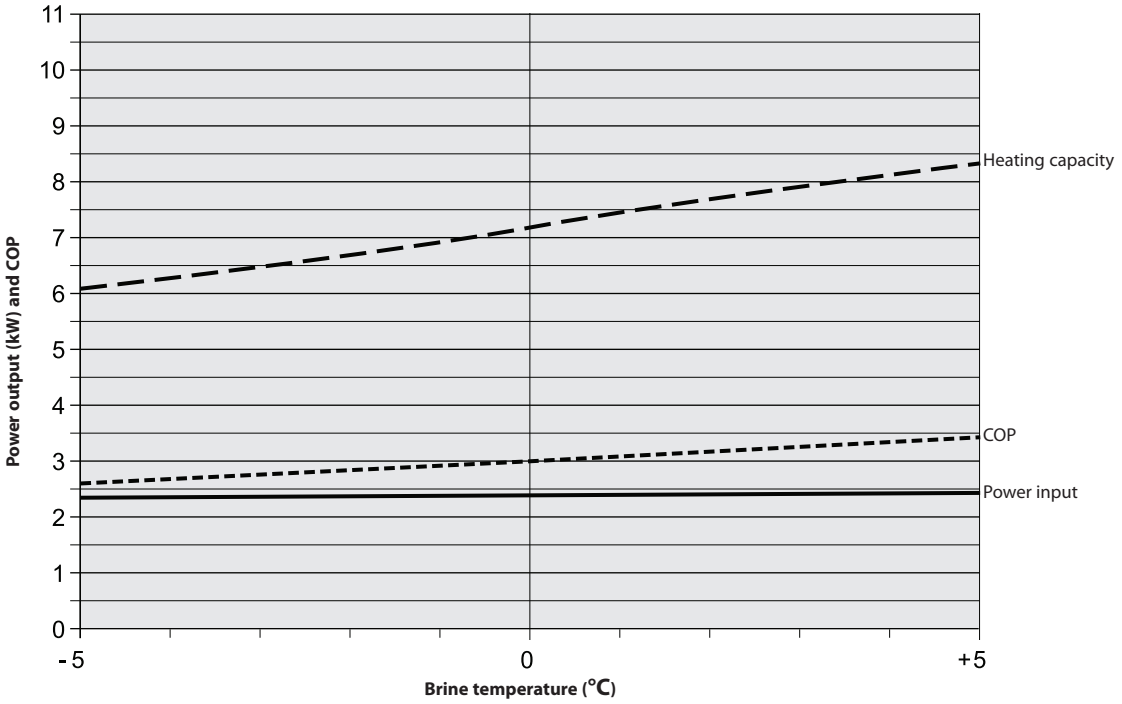
Power output and COP graphs

The data shown in the graphs is according to EN14511 including circulation pumps.

DHP-C 8, supply line 35°C



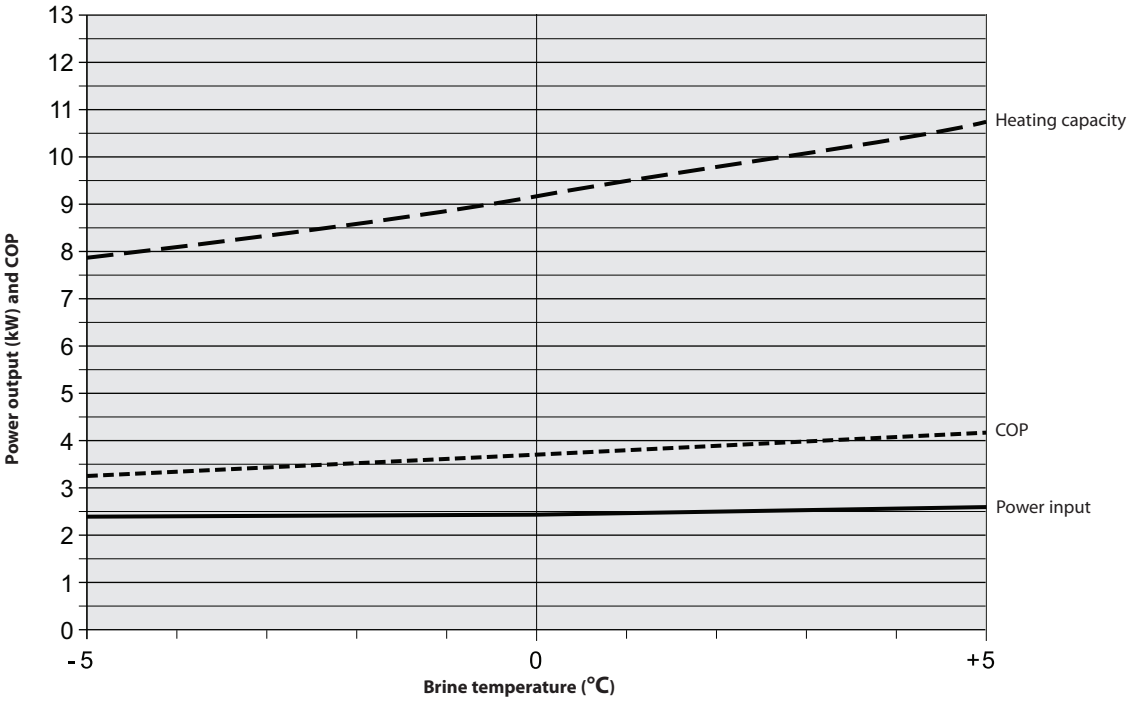
DHP-C 8, supply line 45°C



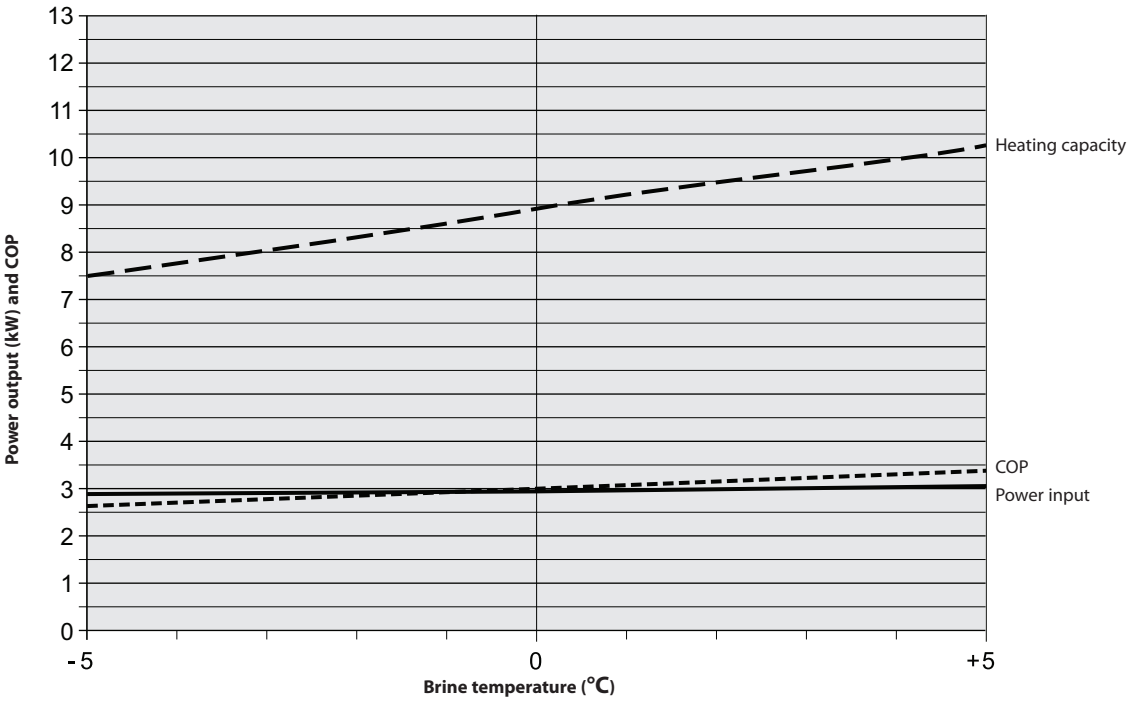
Power output and COP graphs

The data shown in the graphs is according to EN14511 including circulation pumps.

DHP-C 10, supply line 35°C



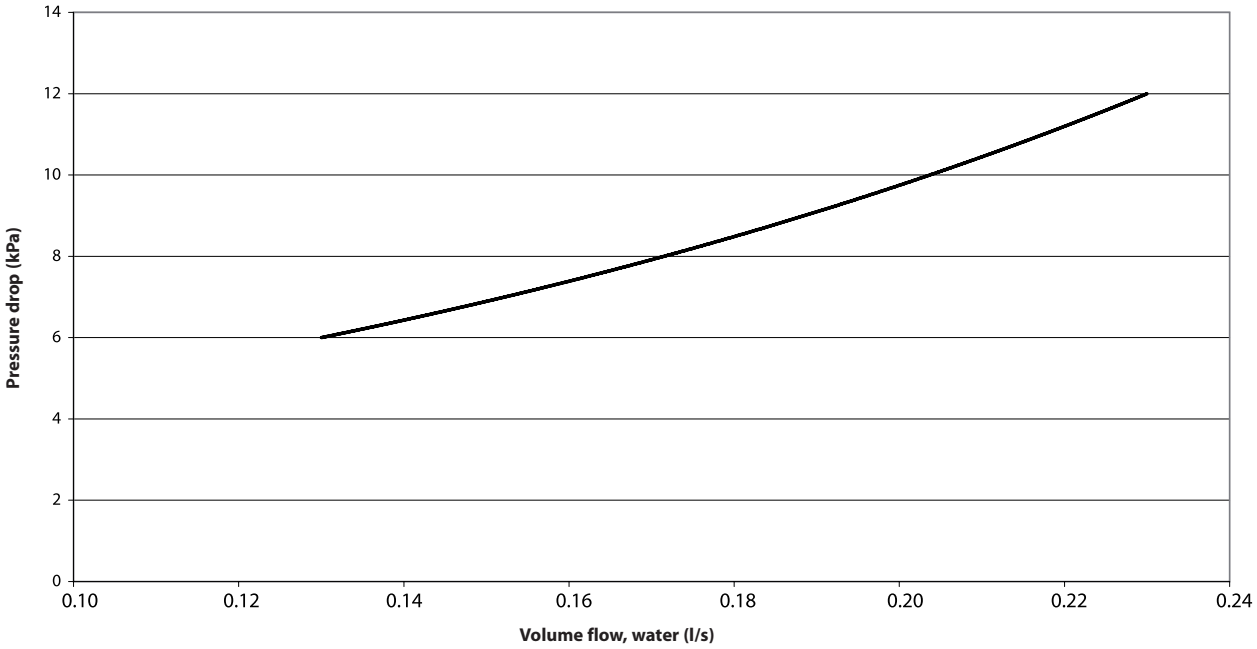
DHP-C 10, supply line 45°C



Pressure drop graphs - Warm side

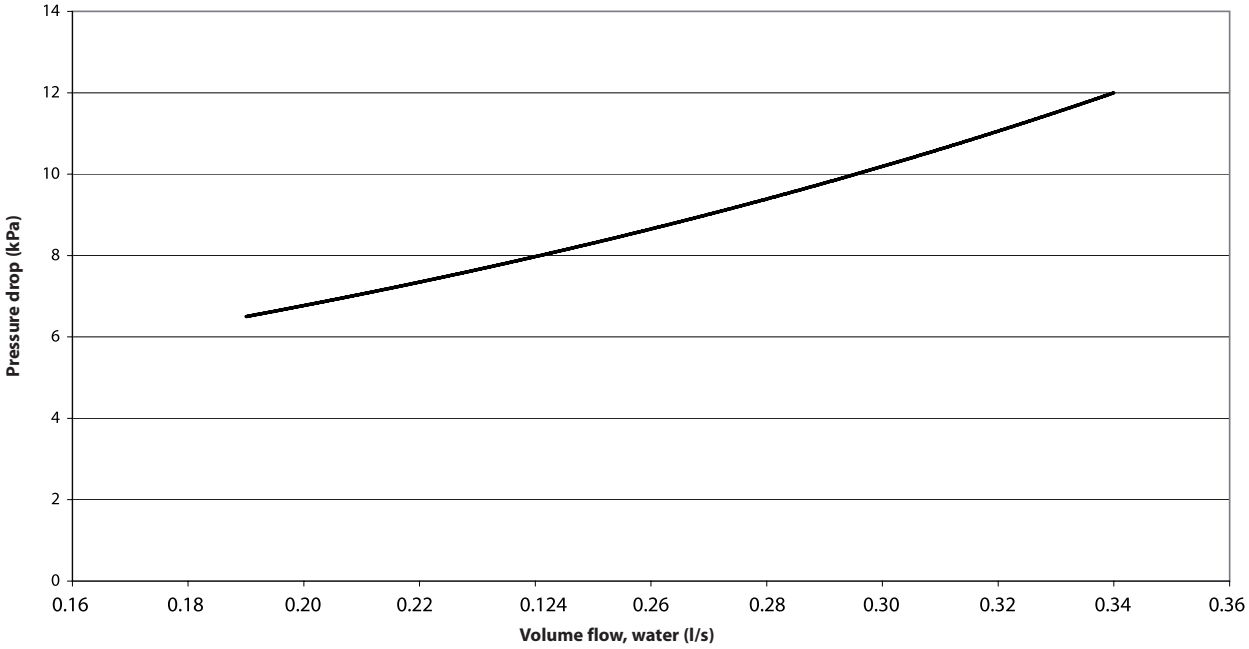
Heat pump, DHP-C6

Pressure drop warm side, estimated from measurements



Heat pump, DHP-C8

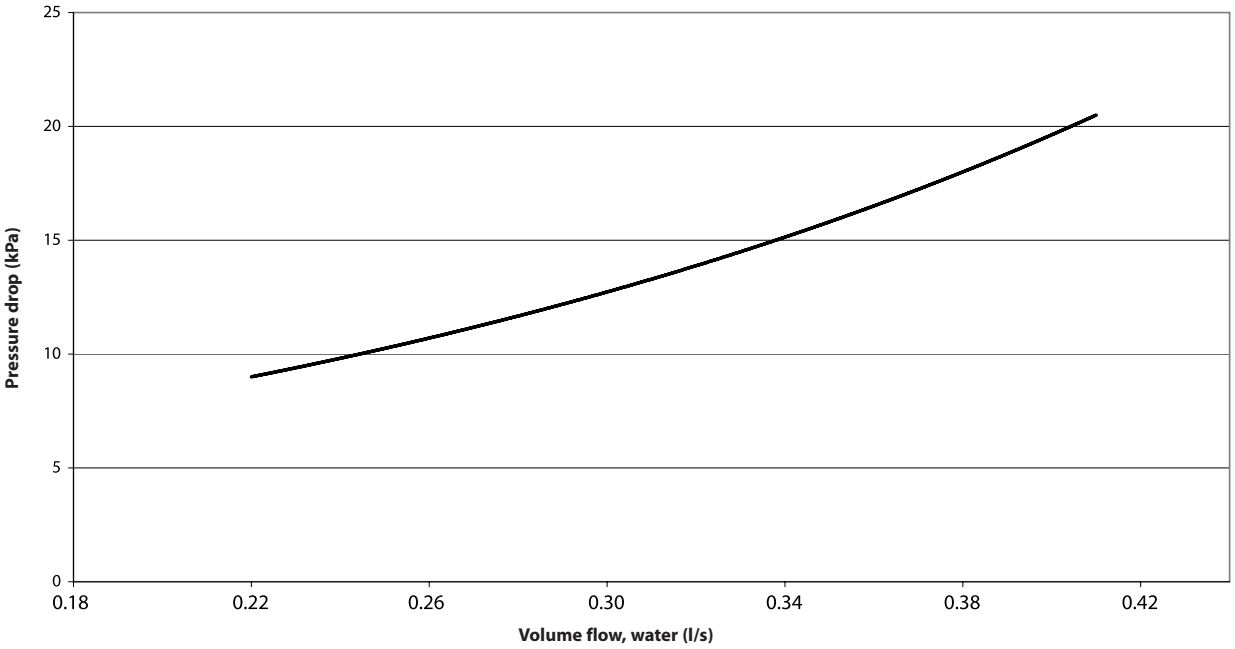
Pressure drop warm side, estimated from measurements



Pressure drop graphs - Warm side

Heat pump, DHP-C10

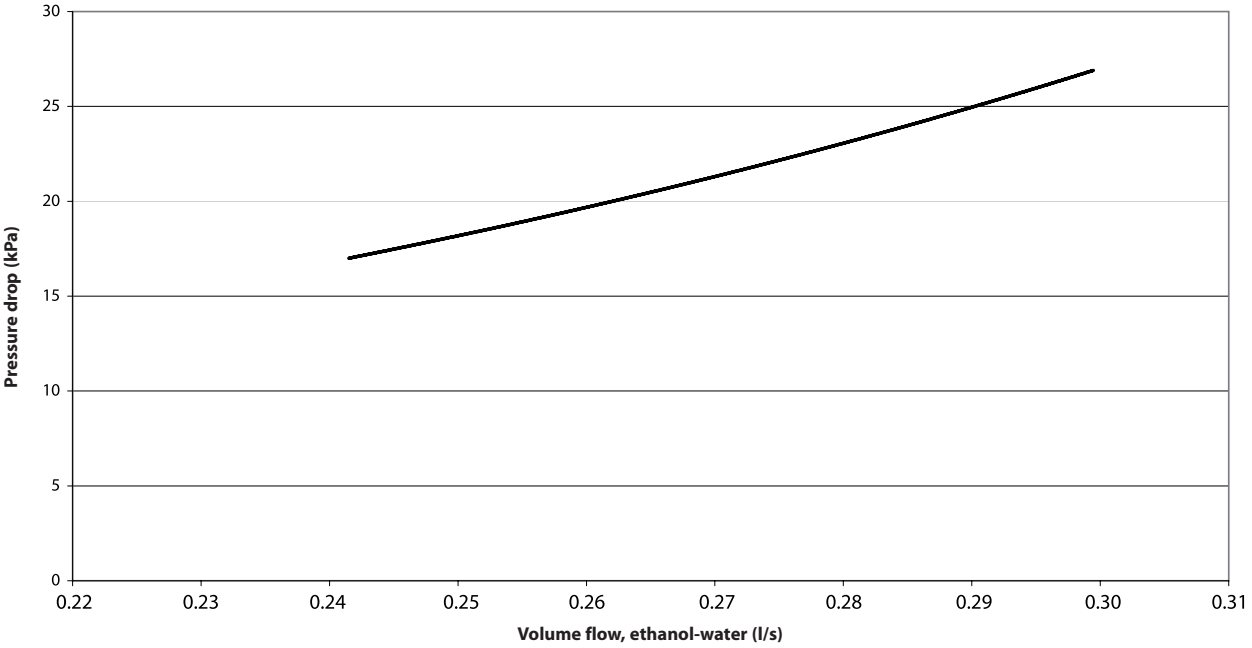
Pressure drop warm side, estimated from measurements



Pressure drop graphs - Cold side

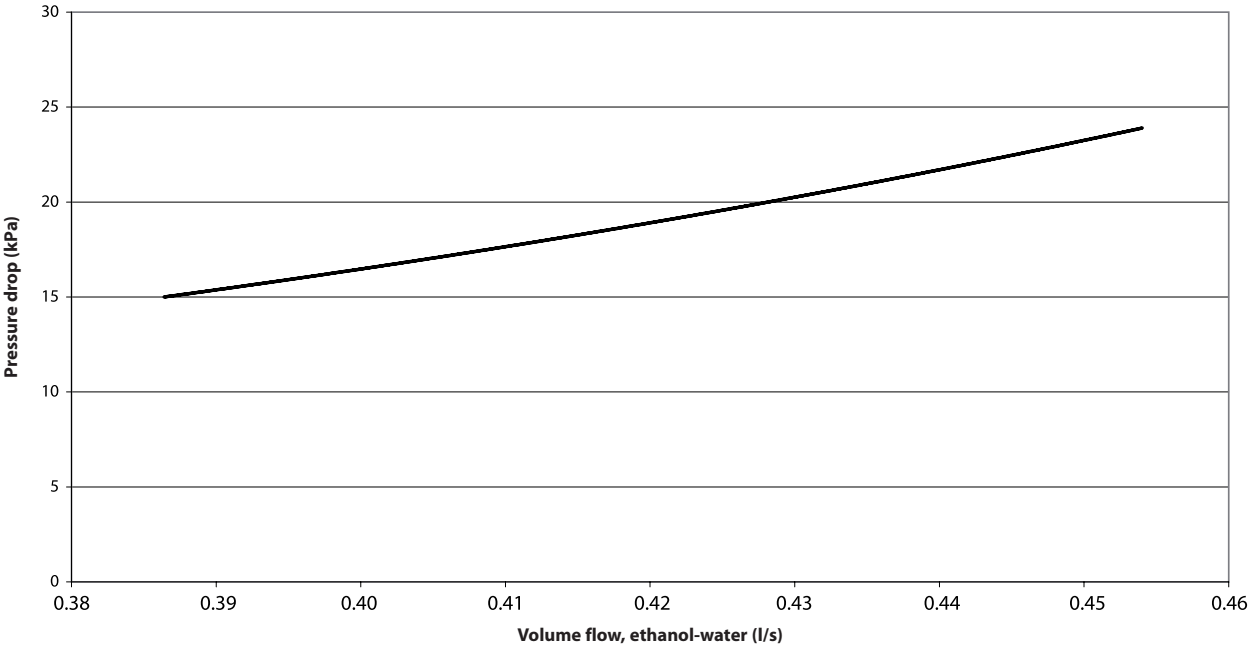
Heat pump, DHP-C6

Pressure drop cold side, estimated from measurements



Heat pump, DHP-C8

Pressure drop cold side, estimated from measurements



Pressure drop graphs - Cold side